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RESTRICTION AND PREVENTION OF CONSUMPTION.

Sometimes called "Tuberculosis," "Phthisis," "Phthisis Pulmonalis," "Tubercular Phthisis," "Tubercular Consumption," or "Pulmonary Consumption."

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[175.]

FIVE THOUSAND, SEPTEMBER, 1891.

Consumption is the most common and fatal disease. In Michigan, it causes more deaths than any other disease. According to the Registration reports, issued by the Secretary of State (1887, p. 231), the average annual number of deaths from consumption in this State for the nineteen years, 1869-1887, is 1,698; but it is believed that not more than two-thirds of the deaths are reported, so that the number of deaths which actually occur in Michigan from consumption is probably over twenty-five hundred per year. A large part of this mortality can and ought to be prevented.

Consumption is now known to be a communicable disease, in which, frequently, the contagium is carried from the dried sputum of a consumptive to the lungs of a susceptible person, where it grows and multiplies and thus produces the disease. The germ which causes consumption is called the *Bacillus tuberculosis*, and it is present in the sputa of consumptives. These bacilli are from about one twenty-thousandth to about one ten-thousandth of an inch in length, and have a breadth about one-sixth of their length. (From 1.5 to 3.5, by .4 micromillimeters.) These bacilli have been thoroughly studied, and repeated successful inoculations have been performed on lower animals. Interesting experiments have been made in this connection by Dr. George Cornet, of the Berlin Hygienic Institute, with the dust of rooms inhabited by consumptives. Dust, collected from those surfaces not likely to be contaminated directly by the spitting or coughing of the patient, was mixed with sterilized bouillon and injected into the peritoneal cavity of guinea pigs. Forty days later the animals were killed, and a careful necropsy was made. Twenty-one hospital wards, in which there were consumptive patients were examined in this way, and from the dust of fifteen of them, tuberculosis was set up in the guinea pigs experimented upon. Private houses where consumptives lived gave similar results; where patients had been in the habit of expectorating on the floor, the dust from the walls was certain to yield infectious cultures, but where cloths or spittoons had been used this was not the case.

The mode of communication of this disease is mainly from the dried sputa from consumptives. The germs in the sputa are carried into the air by sweepings, and deposited upon walls or contents of rooms, or find their way to the lungs of persons.

Destruction of the Sputa.—It is evident that the only certain preventive of consumption is to destroy the sputum from the consumptive before it has an opportunity to dry and scatter the seeds. It is for the consumptive's own safety to destroy the sputa, because it reduces to a minimum the possibility of re-infection. Any person who has an habitual cough, and raises sputa, should have a microscopical examination of the sputa, to ascertain whether it contains the *bacillus tuberculosis*. Without waiting for such examination, in all such cases the sputa should be disinfected.

How the Sputa Should be Destroyed.—No consumptive should expectorate on the floor. Cuspidors, in hotels and other public places and in rooms occupied by consumptives, should be partly filled with water. They should be washed twice each day in boiling water, and the contents should be disinfected with a solution of bichloride of mercury. The cuspidor might well contain constantly a disinfectant, such as a five per cent solution of carbolic acid,—one ounce of carbolic acid dissolved in a pint and a half of water.

The consumptive should carry small pieces of cloth (each just large enough to properly receive one sputum) and paraffined paper envelopes or wrappers in which the cloth, as soon as once used, may be put and securely enclosed, and, with its envelope, burned on the first opportunity.

Destruction of the Dejecta.—All dejecta of a consumptive person should be destroyed or disinfected; because it has been shown that the bacilli are to be found in the urine of persons having tubercular disease of the urinary organs, and in the faeces of those having tubercular disease of the bowels, and they may be in the faeces of those who swallow sputa containing the bacilli, that is, possibly, of any consumptive. Disinfect each discharge from the bowels by thoroughly mixing with it at least one ounce of chlorinated lime in powder, or one quart of "Standard Solution No. 1" recommended by the American Public Health Association's Committee.*

Ventilation of buildings.—Through better systems of ventilation, much may be done for lessening the number of micro-organisms inhaled with the dust of floors, carpets, etc., especially by having the foul-air exits at the floor level, so that the general motion of the foul air shall be downwards, and not upwards into the nostrils of the inmates of the room. This is especially important with reference to all public buildings, as, also, that they shall constantly have a liberal supply of fresh air.

Personal precautions.—Those who sweep and dust rooms which consumptives have occupied might well use respirators. Much may be done to lessen the liability to contract consumption by having the sanitary surroundings as nearly perfect as possible, and by keeping the lungs strong and healthy. It is stated that "in no less than sixty per cent of all patients dying at Bellevue hospital there were old tubercular changes in the lungs, the disease having been recovered from." Similar observations have been made at the Philadelphia hospital, and at the Paris morgue. Dr. Trudeau's experiments prove that rabbits inoculated with the *Bacillus tuberculosis* and kept in a cellar-like place, on restricted diet, died of the disease in much greater proportion than did similar animals similarly inoculated but kept in the open air with abundance of food. These facts emphasize the importance of pure food, pure air, and healthful exercise.

Exposure to cold should be avoided.—Statistics of sickness and of deaths, collated with meteorological statistics, seem to prove that the consumptive processes go on most actively after times of low atmospheric temperature, and least actively after times of high atmospheric temperature. This makes it important that consumptives, and persons susceptible to consumption, should especially guard against the inhalation of cold air. It enforces the importance of having such persons spend the winter and spring months in a climate warmer than that to which they have been accustomed.

Disinfection.—The dusting of objects in the room, the cleansing of floors, walls, and ceiling of the living and sleeping rooms of persons suffer-

* "Standard Solution No. 1" is made by adding to each gallon of soft water four ounces of chloride of lime of the best quality, which should contain at least 25 per cent of available chlorine. "Use one quart of this solution for the disinfection of each discharge in cholera, typhoid fever, etc. Mix well and leave in vessel for at least one hour before throwing into privy-vault or water-closet."

ing from pulmonary consumption should be deferred until after the room and contents have been subjected to the fumes of burning sulphur.

The unwashed clothing of a consumptive should not be mingled with the unwashed clothing of another person; care should be taken that the handkerchiefs be boiled, that other articles liable to harbor the bacillus shall be disinfected, and that no virus come in contact with a cut or injured hand.

No one should sleep in the same room with a consumptive patient; or in a room which has been occupied by a consumptive, unless the room has been previously subjected to the fumes of burning sulphur. A room which has been occupied by a consumptive person may well (with all its contents) be thoroughly disinfected, first subjecting it, for twenty-four hours, to strong fumes of burning sulphur, and then it should for several hours be exposed to currents of fresh air. After fumigation the walls may be rubbed with bread crumbs, which should then be burned.

Rooms to be disinfected by sulphurous fumes must be vacated. For a room ten feet square at least three pounds of sulphur should be used; for larger rooms proportionately increased quantities, at the rate of three pounds for each one thousand cubic feet of air-space.

Hang up and spread out as much as possible all blankets and other articles to be disinfected; turn pockets in clothing inside out, and otherwise facilitate the access of the sulphurous fumes to all infected places.

Close the room tightly, place the sulphur in iron pots or pans which will not leak, supported upon bricks over a sheet of zinc or over water in a tub or pan, so that in case melted sulphur should leak out of the pot the floor may not be burned; set the sulphur on fire by hot coals or with the aid of a spoonful of alcohol lighted by a match; be careful not to breathe the fumes of the burning sulphur, and when certain the sulphur is burning well leave the room, close the door, and allow the room to be closed for twenty-four hours.

Boil milk from suspected sources.—While by far the greater numbers of cases of consumption are caused by the inhalation of the germs of the disease from the dried sputa, the disease may be communicated by the use of milk from tubercular animals. The bacilli of consumption have been found in the milk of cows affected with tuberculosis, even where there was no evidence of localized tuberculosis of the udder. Experiments indicate that, while heating the milk to 167° F. so weakened the virus that six rabbits which drank the milk did not show any traces of the disease, boiling the milk will destroy these germs. These experiments render it important that all milk from suspected sources be boiled before being used.

Tuberculous Meat.—The Paris Congress, for the study of tuberculosis in man and in animals, voted almost unanimously that the flesh from tubercular animals should be destroyed, even where the disease is only localized, if a large part of the organ is affected. Not only should all meat from tubercular animals be destroyed, but all meat from an unknown source should be thoroughly cooked.

The law in this State prohibiting the sale of diseased meat is as follows:

SECTION 1. If any person shall knowingly sell any kind of diseased, corrupted, or unwholesome provisions, whether for meat or drink, without making the same fully known to the buyer, he shall be punished by imprisonment in the county jail not more than six months, or by fine not exceeding two hundred dollars.—§ 9316, Howell's statutes.

Collection of Information.—Health officers and physicians in Michigan are requested to continue to send to the office of the State Board of Health, at Lansing, each year, information concerning cases under their observation where consumption appears to have been communicated,

directly or indirectly, from one person to another, the relation between the individuals, the presence of family predisposition, if any, and other interesting facts in connection with such cases.

DEATHS IN MICHIGAN, 1876-'87. CONSUMPTION.

DIPHTHERIA.

■ TYPHOID FEVER.

■ SCARLET FEVER.

■ WHOOPING-COUGH.

■ MEASLES.

■ SMALL-POX.

This diagram is accurately drawn to a scale, and the *relative importance* of Consumption, as a cause of deaths in Michigan, is, therefore, correctly shown.